

population of the globe; and to exercise their just sway in scenes unpolluted by the many sad acts of human selfishness, perfidy, despotic dominion, and carnage of the older portions of the world.

This colony of Victoria will be added to the list of unexampled strides made in the last half century, and will yet be spoken of in connection with steam-power, gas, a hundred-fold increased manufacturing capabilities, electricity, photography, and the many other additions to human advantages, which are the distinguishing characteristics of our age and nation.

ART. XV.—*Notes on the Cheilostomatous Polyzoa of Victoria and other parts of Australia.* By P. H. MACGILLIVRAY, A.M., M.R.C.S.

[With a Plate.]

[Read before the Institute Oct. 26th, 1859.]

HAVING had opportunities of examining a considerable number of Polyzoa from our own colony and several other parts of Australia, I am induced to present to the Institute a complete catalogue of the species of the Cheilostomatous sub-order which have hitherto come under my observation. A large proportion of them have already been described, but several are new to science, and some previously known are now for the first time recorded as Australian. I would particularly call the attention of any members who may study this class to the fact that little is known of the structure of the animals in the genera most characteristic of the southern seas, and that the details of the anatomy of *Catenicella* especially would be of high scientific interest. I would also recommend a careful examination of the Membraniporidæ, which, although extremely abundant in other parts of the world, seem to have almost escaped the notice of naturalists in Australia, and of which I believe that a diligent search would add many species to our fauna. In other genera also a large accession to the already extensive list may be confidently anticipated.

The arrangement adopted is that given by Mr. Busk, in his admirable British Museum Catalogue.

I would here beg to express my thanks to those friends who have kindly aided me by the contribution of specimens,

and especially to Mrs. Robertson, Dr. Mueller, Mr. Ellery, and Mr. Verdon, whose donations have been most valuable.

Class.—POLYZOA.

Order I.—P. INFUNDIBULATA.

Sub-order I.—CHEILOSTOMATA.

Sect. I.—Articulata.

Subsect I.—Uniseriaria.

I. Fam. CATENICELLIDÆ, Busk.

I. Gen. *Catenicella*, Blainville.

a.—*Catenicellæ fenestratæ*, Busk.

1. *C. lorica*, Busk. Port Phillip, Dr. Mueller; Cape Otway, Mr. J. Payter.
2. *C. ventricosa*, Busk. Queenscliff; Western Port; Sealers' Cove, Dr. Mueller.

A very variable species; lower lip sometimes notched, at other times with a minute submarginal pore, and frequently straight and entire.

3. *C. hastata*, Busk. Queenscliff; Western Port; Cape Otway, Mr. J. Payter; Cape Lefebvre and Sealers' Cove, Dr. Mueller.

Of this species there are two marked varieties. The common form agrees precisely with the description and figure given by Busk. The other is much stouter, and has the lateral processes of enormous size, extending completely to the base of the cell, as in *C. alata*, which species this form very much resembles; the superior processes are broad, rounded, and pierced by numerous apertures, the avicularian chambers wider than in the common variety, and the large inferior process also frequently presents several apertures. It may always be readily distinguished from *C. alata*, the only species with which it can be confounded, by the perforations on the supra-avicularian process.

4. *C. alata*, Wyv. Thomson. Queenscliff; Kangaroo Island; Holdfast Bay, Dr. Mueller.
5. *C. plagiostoma*, Busk. Western Port; Queenscliff; Cape Otway, Mr. J. Payter; Sealers' Cove, Dr. Mueller.

6. *C. cribraria*, Busk. Western Port; Port Phillip; Sealers' Cove, Dr. Mueller.
7. *C. margaritacea*, Busk. Queenscliff; Western Port; Cape Otway, Mr. J. Payter; Kangaroo Island, Dr. Mueller.

β.—*Catenicellæ vittatæ*, Busk.

8. *C. formosa*, Busk. Western Port, parasitic on *C. hastata*.
9. *C. perforata*, Busk. Queenscliff; Cape Otway, Mr. J. Payter; King's Island.
10. *C. elegans*, Busk. Queenscliff; Western Port; Sealers' Cove, Dr. Mueller.
11. *C. Dawsoni*, Wyv. Thomson. Queenscliff; Cape Otway, Mr. J. Payter; Encounter Bay, Dr. Mueller. I have found both the varieties described by Professor Thomson.
12. *C. castanea*, Wyv. Thomson. Queenscliff; Western Port.
13. *C. Buskii*, Wyv. Thomson. Western Port.

γ.—*Catenicellæ auritæ*, Wyv. Thomson.

14. *C. aurita*, Busk. Queenscliff; Western Port; Cape Otway, Mr. J. Payter; Wilson's Promontory, Dr. Mueller.

One large central pore, situated on an eminence, is constantly present; there are also generally several smaller perforated papillæ round it, and occasionally there is a crescentic series of small, round, distinct cavities or foramina extending along the lower border of the anterior surface of the cell, seemingly of the same nature as the markings in the *C. fenestrata*.

15. *C. geminata*, W. Thomson. Western Port, on *C. ventricosa*; Queenscliff.

Sub-sec. II.—Bi-multiserialaria.

II. Fam. SALICORNARIADÆ, Busk.

I. Gen. *Salicornaria*, Cuv.

1. *S. farciminoïdes*, Johnst. Queenscliff.

2. *S. gracilis*, Busk. Sealers' Cove and Cape Lefebvre, Dr. Mueller.
3. *S. tenuirostris*, Busk. Sealers' Cove, on *Callophyllis*, Dr. Mueller.

II. Gen. *Nellia*, Busk.

1. *N. oculata*, Busk. Port Curtis, Mr. Griffiths.

III. Gen. *Onchopora*, Busk.

1. *O. hirsuta*, Busk. Western Port, Mr. Verdon; Queenscliff; Cape Otway, Mr. J. Payter.

III. Fam. CELLULARIADÆ, Busk.

I. Gen. *Cellularia*, Pallas.

1. *C. cuspidata*, Busk. Queenscliff; Western Port; Cape Otway, Mr. J. Payter; Sealers' Cove, Dr. Mueller.

A specimen from Western Port has two spines on the internal margin.

II. Gen. *Menipea*, Lamx.

1. *M. Cyathus*, W. Thomson. Western Port, on *Serialaria cornuta*, Mr. Verdon; Cape Otway, Mr. J. Payter; Queenscliff, Mr. Gale.
2. *M. crystallina*, Gray. Queenscliff; Cape Otway, Mr. J. Payter; Western Port; Encounter Bay, Dr. Mueller.
3. *M. Buskii*, W. Thomson. Western Port; Queenscliff; Sealers' Cove, Dr. Mueller.
4. *M. tricellata*, Busk. Frequent on Algæ and Polyzoa.

III. Gen. *Scrupocellaria*, Van Beneden.

1. *S. scrupea*, Busk. Queenscliff.
2. *S. cervicornis*, Busk. Port Curtis, Mr. Griffiths.

IV. Gen. *Canda*, Lamx.

1. *C. arachnoides*, Lamx. Sealers' Cove, on *Champia parvula*, Dr. Mueller; Western Port.

Sect. II.—Inarticulata.

Sub-sec. I.—Uniserialaria.

IV. Fam. SCRUPARIADÆ, Gray.

I. Gen. *Hippothoa*, Lamx.

1. *H. patagonica*, Busk. Point Rapid, River Tamar, V. D. L., on *Delesseria* and *Lenormandia*, Dr. Mueller.

In many specimens the cells are aggregated, forming continuous membranous expansions, with quite the aspect of a *Lepralia*. The ovicells are galeate, terminal in the branched form, interspersed among the cells in the membraneous variety.

II. Gen. *Ætea*, Lamx.

1. *Æ. dilatata* Busk. Queenscliff; Cape Otway, Mr. J. Payter; Wilson's Promontory, Dr. Mueller.
2. *Æ. ligulata*, Busk. Cape Otway, Mr. J. Payter.

Sub-sec. II.—Bi-multiserialaria.

V. Fam. GEMELLARIADÆ.

I. Gen. *Dimetopia*, Busk.*

1. *D. spicata*, Busk. Queenscliff; Cape Otway.
2. *D. cornuta*, Busk. Sealers' Cove, Dr. Mueller.

II. Gen. *Didymia*, Busk.

1. *D. simplex*, Busk. Queenscliff.

VI. Fam. CABEREADÆ, Busk.

I. Gen. *Caberea*, Lamx.

1. *C. rudis*, Busk. Port Phillip, Dr. Mueller.

VII. Fam. BICELLARIADÆ, Busk.

I. Gen. *Bicellaria*, Blainv.

1. *B. grandis*, Busk. Cape Otway, Mr. J. Payter; Port Curtis, Mr. Griffiths.

* The name, *Dimetopia*, Dr. Mueller informs me, was applied by De Candolle many years ago to a genus of Umbelliferae. Dr. Mueller suggests that the synonymous term *Bifrons* might be substituted for the present genus.

2. *B. tuba*, Busk. Queenscliff and Western Port.

II. Gen. *Halophila*, Gray.

1. *H. Johnstoniæ*, Gray. Sealers' Cove, Dr. Mueller.

III. Gen. *Bugula*, Oken.

1. *B. neritina*, Lamx. Queenscliff and Hobson's Bay.
 2. *B. avicularia*, Pall. Hobson's Bay.
 3. *B. dentata*, Lamx. Hobson's Bay.

VIII. Fam. FLUSTRADÆ, Gray.

I. Gen. *Flustra*, L.

1. *F. denticulata*, Busk. Queenscliff; King's Island, Mr. McGowan; Port Curtis, Mr. Griffiths.

None of my specimens present the large, flat, marginal processes described and figured by Busk. In some there are two or four stout spines at the margins of the mouth; while in one form from King's Island they are entirely wanting, and the upper half of each cell is provided on either side with four or five short, sharp, conical processes arching over the cell. The series of minute marginal denticles, and the peculiar form of the avicularium are the only constant characters, and afford a ready means of recognising the species.

II. Gen. *Carbasea*, Gray.

1. *C. pisciformis*; Busk. Queenscliff, Mrs. Robertson.
 2. *C. dissimilis*, Busk. Queenscliff; King's Island, Mr. McGowan.

Specimens received from Queenscliff and King's Island have a small, blunt, marginal process on either side of the mouth; in the form of the marginal cells, however, and the constant presence of the peculiar avicularium at the base of each cell, they agree perfectly with the Tasmanian form.

3. *C. episcopalis*, Busk. Queenscliff; King's Island, Mr. McGowan.
 4. *C. cyathiformis*, P. McG. Queenscliff; Cape Otway, Mr. J. Payter.

III. Gen. *Diachoris*, Busk.

1. *D. spinigera*, n. s., pl. II., figs. 1. and 2. Cells elongate-oval, entirely open in front; three or four long straight spines springing from the upper margin, and a series, usually five, of long slender incurved spines arising from the margin on either side; a large pedunculate avicularium situate on one side of the mouth; back of cells smooth; ovicells —?

Wilson's Promontory, a single specimen, Dr. Mueller.

IX. Fam. MEMBRANIPORIDÆ, Busk.

I. Gen. *Membranipora*, Johnst.

1. *M. membranacea*, L. Queenscliff, on Algæ; Warnambool, Mr. Hannaford.

In the Australian form the cells are much elongated, of nearly uniform width throughout, and truncate at either end.

2. *M. pilosa*, L. Queenscliff; Cape Otway, Mr. J. Payter; Wilson's Promontory and Sealers' Cove, Dr. Mueller.

In all the specimens I have seen the marginal processes are constantly three on each side, and the submarginal vibraculum of enormous length, giving the specimen the appearance, to the naked eye, of being clothed with long hairs.

3. *M. umbonata*, Busk. Queenscliff; Kangaroo Island, Dr. Mueller.

4. *M. mamillaris*, n. s., pl. II., fig. 3. Front of cell oblong, slightly punctate; margins narrow, raised, smooth; mouth very narrow, lofty, with thickened margin, and a short, thick, mamilliform process on either side. A single large avicularium on the front of the cell inferiorly; mandible triangular, pointed.

This species is nearly allied to *M. umbonata*, from which it may be distinguished by the different form of the avicularium. Like the last also, it presents a striking resemblance to a *Lepralia* in the radiate disposition of the cells. Colour, purple.

Queenscliff, on sea-weed.

5. *M. cervicornis*, Busk. Port Phillip, encrusting a species of Sargassum.

In my specimens the branching processes are considerably more slender than in the specimen figured in the British Museum Catalogue, and seldom inosculate. The ovicells are galeate, sculptured, and frequently have a small avicularium in front.

6. *M. perforata*, P. McG. Queenscliff; Tasmania, on *Delesseria* and *Lenormandia*, Dr. Mueller.

II. Gen. *Lepralia*, Johnst.

1. *L. pertusa*, Johnst.
2. *L. ciliata*, Johnst.
3. *L. canaliculata*, P. McG. Queenscliff.
4. *L. candida*, P. McG. Queenscliff.
5. *L. excavata*, n. s., pl. II., fig. 4. Cells immersed, elongated, running in lines; elongated areolæ round the margins, leaving a narrow smooth surface in front; mouth nearly vertical to the plane of the polyzoary, its upper border armed with four straight stiff spines, the lower lip with a deep notch, inside the bottom of which is usually a small simple denticle.

The marginal areolation seems to consist of a series of horizontal tubes, opening in front by oval pores, and occasionally, from the anterior wall being destroyed, giving the appearance of deep channels.

Queenscliff, on mussel shell.

6. *L. lunata*, n. s., pl. II., fig. 6. Cells rhomboidal, immersed, areolated at the margin; mouth arched above, straight below, with four or five spines on the upper margin; a lunate pore below the mouth; a large avicularium at one side of the mouth, mandible very long, pointed.

Queenscliff, on mussel shell.

7. *L. elegans*, n. s., pl. II., fig. 5. Cells diamond-shaped, irregularly oval or octagonal, quincuncial, separated by a thick raised margin; mouth rounded, with a slightly thickened lip; surface of cell areolated, the areolæ frequently radiating from an elevated portion below the lower lip.

From *L. areolata* it differs in the absence of the large sinuous spout, and in the thinness of the mouth-margin. Queenscliff.

X. Fam. CELLEPORIDÆ, Busk.

I. Gen. *Cellepora*, O. Fabricius.

1. *C. pumicosa*, L. Queenscliff.
2. *C. fusca*, Busk. King's Island, Mr. Arnold.
3. *C. exigua*, n. s., pl. III., figs. 4 and 5. Polyzoary small, foliaceous, expanded, free; cells irregular, areolated at the edges; rostrum prominent, below the mouth, with an avicularium on its inner aspect; avicularia numerous, scattered, mandible triangular, pointed.

Queenscliff, on zoophyte.

XI. Fam. ESHCARIDÆ, Johnst.

I. Gen. *Eschara*, Ray.

1. *E. chartacea*, Lamx. Pl. III., figs. 1, 2, and 3.

I have received from Port Curtis and King's Island two distinct varieties, which seem referable to this species. In both the polyzoary is very much convoluted, thin, and excessively brittle; the cells are oblong, arranged in linear series, separated by raised margins, and are partially filled in by a dense granular membrane, leaving an oval or elliptical opening, the edges of which are thickened. In specimens from Port Curtis the cells are nearly square, the margins thick and strongly crenulate, and the edge of the opening minutely denticulate. In those from King's Island the cells are very much more elongated, the raised margins are nearly smooth, and the membrane is not so strongly granular; ovicells deeply immersed. The first form occasionally occurs decumbent in a single layer on algæ.

Port Curtis, Mr. Griffiths; King's Island, Mr. Arnold.

2. *E. platalea*, Busk. Port Curtis, Mr. Griffiths.

Besides the large spoon-shaped avicularia, in one specimen, there are numerous others, small, scattered, and with pointed, triangular mandibles, mostly directed obliquely across the cells.

3. *E. lichenoides*, Milne Edwards. King's Island, Mr. Arnold.
4. *E. decussata*, Milne Edwards. Queenscliff.

II. Gen. *Retepora*, Imperato.

1. *R. phoenicea*, Busk. King's Island, Mr. McGowan.
2. *R. monilifera*, n. s., pl. III., figs. 6-9.

Polyzoary rising from a narrow base, much convoluted, consisting of a number of turbinated portions densely crowded and confused. Cells decumbent, oval, ventricose; mouth round, with usually a projection on the under lip sometimes surmounted by an abortive avicularium; frequently an avicularium at the side of the mouth; occasionally instead of the mucro there is a slight notch on the lower lip. Ovicells numerous, galeate; a beaded rim occupying the upper edge of the aperture, and extending as a club-shaped band along the middle of the anterior surface for about two-thirds of its length.

King's Island, Mr. Arnold; Queenscliff.

Explanation of Plates.

PLATE II.

- Fig. 1. *Diachoris spinigera*, front.
 " 2. " " " back.
 Fig. 3. *Membranipora mamillaris*.
 Fig. 4. *Lepralia excavata*.
 Fig. 5. *Lepralia elegans*.
 Fig. 6. *Lepralia lunata*.

PLATE III.

- Figs. 1 and 2. *Eschara chartacea*.
 Fig. 3. *Eschara chartacea*, edge view.
 Fig. 4. *Cellepora exigua*, natural size.
 " 5. " " magnified.
 Fig. 6. *Retepora monilifera*, natural size.
 " 7. " " magnified.
 " 8. " " more highly magnified.
 " 9. " " ovicells, do.